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PATENTS AS COMMERCIAL ASSETS IN POLITICAL, LEGAL AND SOCIAL CONTEXT

Adam Mossoff*

CHRISTOPHER BEAUCHAMP, *INVENTED BY LAW: ALEXANDER GRAHAM BELL
AND THE PATENT THAT CHANGED AMERICA* (HARVARD UNIVERSITY PRESS
2015). PP. 268. HARDCOVER \$ 35.00.

Alexander Graham Bell is an icon of American invention. He is well known both in popular culture¹ and to judges, lawyers, and academics.² For many lawyers and legal scholars, though, our knowledge of Bell and his famous telephone invention is most likely gleaned from excerpts of the Supreme Court's famous decision in 1888 that affirmed the validity of his patent and its infringement by numerous telephone companies.³ Of course, these are *excerpts*, because this is the only Supreme Court case record and opinion that fills an entire volume of the *United States Reports*.⁴ This context has now been expanded, and the scholarly perspective of Bell's patented innovation has been radically revised, by Christopher Beauchamp's *Invented by Law: Alexander Graham Bell and the Patent that Changed America*.⁵

The title of Beauchamp's book, *Invented by Law*, makes it appear that his primary focus is the famous Supreme Court opinion and the multiple patent lawsuits that led to it. This assumption is understandable given the heavy emphasis in scholarship today on patent litigation in both empirical studies and theoretical analyses.⁶ It is also the impression created in the first few pages, in which Beauchamp notes that the answer to the hoary

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1. See, e.g., *Schoolhouse Rock! Mother Necessity, where would we be?* (Am. Broad. Co. 1977) ("Ring me on the Alexander Graham Bell/Thank you Alexander for the phone/I'd never get a date/I'd never get a job/Unless I had a telephone").

2. See, e.g., *Bilski v. Kappos*, 561 U.S. 593, 620 n.2 (2010).

3. See, e.g., ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, *PATENT LAW AND POLICY: CASES AND MATERIALS* 92-97 (4th ed. 2007).

4. See *Dolbear v. Am. Bell Tel. Co.*, 126 U.S. 1 (1888) ("The Telephone Cases").

5. CHRISTOPHER BEAUCHAMP, *INVENTED BY LAW: ALEXANDER GRAHAM BELL AND THE PATENT THAT CHANGED AMERICA* (2015).

6. See, e.g., David L. Schwartz & Jay P. Kesan, *Analyzing the Role of Non-Practicing Entities in the Patent System*, 99 CORNELL L. REV. 425 (2014) (assessing empirical claims about patent litigation); Eric R. Claeys, *The Conceptual Relation Between IP Rights and Infringement Remedies*, 22 GEO. MASON L. REV. 825 (2015) (assessing the *eBay* decision and the nature of injunctions in securing property rights).

question in American patent law, “Who is the inventor?”⁷ includes as its answer both lawyers and judges.⁸ Beauchamp observes that “[t]he Bell litigation was one of the largest courtroom conflicts of any kind during the nineteenth century.”⁹ For many scholars and lawyers, a gripping tale of courtroom battles appears to await us in the following pages.

But this assumption would be wrong—another example of the classic cliché that one should not judge a book by its cover. Beauchamp signals that patent litigation is not the primary focus, as he quickly points out that a complete analysis of “the effect of patents on society means looking at how they were exploited in practice, not just how they were litigated in the courts.”¹⁰ Accordingly, the litigation that gave rise to the Supreme Court case, known today as *The Telephone Cases* given that it consolidated appeals from many separate lawsuits, does not appear until well over one-third of the way into the book.¹¹ Before this point, Beauchamp surveys the rise of patents as commercial assets within their legal, political, and social context in America, which then sets the stage for Beauchamp’s careful and in-depth account of Bell’s similar commercial exploitation of his patented telephone.¹²

In his characteristically engaging and witty writing style that presents facts he has culled from primary-source materials,¹³ Beauchamp does indeed cover the litigation campaigns waged over the various patents on telephone technology throughout the United States and in Europe.¹⁴ But *Invented by Law* does much, much more than this.¹⁵ Beauchamp details at great length the wide-ranging commercial, legal, social, and political context in which inventions are created, patented, brought to market through myriad institutional and commercial mechanisms, and ultimately brought to the courthouse.¹⁶ Thus, one of the most important insights from Beauchamp’s meticulous case study of Bell’s invention of the telephone is that “[p]atents were ultimately a tool of business” that “exist as landmarks in the history of technology only because economically motivated actors were willing and able to seek particular articles of intellectual property at particular times.”¹⁷

Invented by Law simply cannot be given its proper due in a brief review essay, because there is so much in it of value to lawyers, historians, economists, and many other scholars.¹⁸ Thus, this essay will be limited to two issues of interest to lawyers and legal

7. At least, this was the fundamental question before the America Invents Act of 2011, which altered the American patent system to a first-to-file system. Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 3, 125 Stat. 284, 285. *See id.* at 285-86 (establishing the “effective filing date” of the patent application as the standard for assessing the novelty requirement).

8. *See* BEAUCHAMP, *supra* note 5, at 5, 84.

9. *Id.* at 5.

10. *Id.* at 8.

11. *Id.* at 78.

12. *See generally id.*

13. *See* BEAUCHAMP, *supra* note 5. *See also* Christopher Beauchamp, *The First Patent Litigation Explosion*, YALE L.J. (forthcoming 2016), <http://cpip.gmu.edu/wp-content/uploads/2015/06/The-First-Patent-Litigation-Explosion-Christopher-Beauchamp.pdf>.

14. BEAUCHAMP, *supra* note 5, at 78, 148.

15. *See id.*

16. *See generally id.*

17. *Id.* at 206 (emphasis added).

18. To take but one example of an important issue unaddressed in this review essay: Beauchamp presents an utterly fascinating account of how the economic theory of network effects and “lock in” are both confirmed and

scholars today simply because this review essay is published in a law journal. The context for these two issues is the recent patent war wrought by the wireless computing revolution—the smartphone war¹⁹—which has raised important questions and a heated policy debate about the role of patents in the innovation economy.²⁰ As a result, lawyers and legal scholars will first find *Invented by Law* of interest, because Beauchamp carefully explicates the investments, commercial innovation, business wrangling, and widespread licensing of patents in the nineteenth century. This is significant, because the patent licensing business model and other complex forms of commercial development of patents are attacked today in highly charged terms—the companies engaged in these practices are referred to by the epithet “patent trolls” and their licensing of patent portfolios are alleged to be entirely novel.²¹ Second, and closely related to this first point, the smartphone war itself is alleged to be a novel phenomenon, but *Invented by Law* presents an account of how cycles of innovation, litigation, and ensuing public policy debate about patents have been a constant feature in Anglo-American society since the Industrial Revolution. In sum, *Invented by Law* disabuses both of these mistaken historical assumptions in the patent policy debates today.

It bears emphasizing, though, that Beauchamp is a first-rate historian, and thus he avoids the vice of engaging in “law office history.”²² Although he does nod briefly at times in the direction of these modern policy debates,²³ the substance of his book focuses entirely on the nineteenth and early twentieth centuries in diligently reporting the historical facts. In so doing, though, *Invented by Law* presents a compelling historical account of patented innovation, and lawyers and legal scholars will find this valuable because it belies many assertions today about the commercial development of these patents and their extensive litigation as well. As Beauchamp puts the point: “all this has happened before, if not in its precise details, then at least in familiar outlines.”²⁴ But the chief value in *Invented by Law* is not that it merely sheds light on contemporary policy debates. There is much in this monograph that is of deep interest to historians, economists, business school professors, and any others interested in the evolution of technology, commercial business models, and litigation and in other features of advanced legal systems and complex innovation-based economies. This is a book that will be richly mined for its many resources by lawyers and scholars of all stripes for many years to come.

called into question by the development of the telephone industry. *Id.* at 185-204. Institutional economists and legal scholars, among many others, will learn much from this discussion.

19. See Kirti Gupta & Mark Snyder, *Smartphone Litigation and Standard Essential Patents* 12 (Stan. Univ. Hoover Inst., Working Paper No. May 16, 2014), <http://ssrn.com/abstract=2492331>.

20. See, e.g., B. Zorina Khan, *Trolls and Other Patent Inventions: Economic History and the Patent Controversy in the Twenty-First Century*, 21 GEO. MASON L. REV. 825 (2014).

21. See *infra* notes 25-27.

22. See Adam Mossoff, *Who Cares What Thomas Jefferson Thought About Patents? Reevaluating the Patent “Privilege” in Historical Context*, 92 CORNELL L. REV. 953, 1011 (2007) (discussing in the context of patent law the “‘law office history’ critique [of how] lawyers only use history for supporting preconceived policy goals”).

23. See, e.g., BEAUCHAMP, *supra* note 5, at 211-12.

24. *Id.* at 10.

I. PATENTS AS COMMERCIAL ASSETS

Many people assert today that the commercial development of patented innovation through complex financial arrangements and myriad business models, such as licensing, is a relatively novel phenomenon.²⁵ Third-parties investing in, selling or buying, or merely serving as commercial intermediaries in bringing patented innovation to the marketplace, especially through a licensing business model, is alleged not just to be new, but some assert that this novel practice is harmful because it leads to increased litigation.²⁶ Many people, including even the eminent Judge Richard Posner, seem to believe that the original, historical function of the patent system was simply to incentivize an inventor to become a manufacturer after receiving a patent for a new technological innovation.²⁷ The policy question of whether licensing patents or patent portfolios, or engaging in other complex commercial uses of patents, should occur is beyond the scope of this review essay, which focuses on only how *Invented by Law* makes clear that these historical assumptions in today's debates are profoundly mistaken.

From its inception, Beauchamp explains that “the character of the Bell enterprise” was tantamount to a “high-tech start-up whose strategies were driven by investor relations and the [commercial] exploitation of patents.”²⁸ This was neither new nor particularly unique to Bell. As Beauchamp notes, decades before Bell's inventive and commercial activities there arose in the mid-nineteenth century “industry leaders embracing innovation as a business strategy and using patents systemically to manage and control the [commercial] process.”²⁹

Long before Bell patented his invention,³⁰ a businessperson known as a “patent agent” (who was also sometimes a lawyer) became a common fixture in both the commercialization and litigation of patents.³¹ Patent agents functioned as commercial intermediaries for patent owners by licensing patent rights to manufacturers or retailers, selling and buying patents in what is now called the “secondary market,” and even filing lawsuits. Patent agents arose in the first decades of the nineteenth century. Beauchamp reports that in the first decade inventor Oliver Evans employed “licensing agents in six states” to commercially exploit and “to institute litigation” on behalf of his patents in “flour-milling and steam engine technology.”³² Later in the 1830s and 1840s, patent agents facilitated William Woodworth's commercial sale of his patents “to a syndicate that set out to enforce

25. See, e.g., Adam Mossoff, *Patent Licensing and Secondary Markets in the Nineteenth Century*, 22 GEO. MASON L. REV. 959, 966 n.44 (2014) (surveying claims by law professors who make this claim); Khan, *supra* note 20, at 837-39; Naomi R. Lamoreaux, Kenneth L. Sokoloff & Dhanoos Sutthiphisal, *Patent Alchemy: The Market for Technology in US History*, 87 BUS. HIST. REV. 3, 3-5, 34-36 (2013).

26. See, e.g., Colleen V. Chien, *From Arms Race to Marketplace: The Complex Patent Ecosystem and Its Implications for the Patent System*, 62 HASTINGS L.J. 297, 297 (2010) (“Recently, a secondary market for patents has flourished, making it more likely that patents that would otherwise sit on the shelf will end up in the courtroom.”).

27. See Mossoff, *supra* note 25, at 960 nn.6-7 (identifying claims by Judge Posner and others).

28. BEAUCHAMP, *supra* note 5, at 35.

29. *Id.* at 36.

30. See U.S. Patent No. 174,465 (issued Mar. 7, 1876).

31. See Mossoff, *supra* note 25, at 967-68.

32. BEAUCHAMP, *supra* note 5, at 17-18.

the patent,”³³ they assisted Samuel Morse in his use of licensing as a way to promote the development of his patented electro-magnetic telegraph,³⁴ and they were invaluable to Charles Goodyear’s similar use of licensing to commercialize his patented rubber.³⁵ Many other inventors took advantage of these commercial intermediaries. In sum, it is evident that the complex commercial development of patents by third parties was a widespread feature of the American innovation economy from the first years of the patent system. This was the legal and commercial context in which Bell acquired investors for his inventive activities,³⁶ patented his invention,³⁷ purchased other patents,³⁸ and converted his invention into real-world innovation through its commercial exploitation,³⁹ as Beauchamp details throughout his monograph.

But the marketplace innovation prompted by securing property rights in technological innovation went far beyond the mere existence of commercial intermediaries like patent agents. Throughout the evolution of the technological advances in both the telegraph and the telephone, Beauchamp reveals how property rights in innovation (patents) were used as commercial assets in structuring the design of the firms who were investing in and deploying these assets in the marketplace.⁴⁰ It is a story that involves not just Bell, but also his primary competing inventor, Thomas Edison, and Edison’s commercial partner of sorts, Western Union. The commercial choices by these individuals and companies, as well as the litigation campaigns they waged against each other, fundamentally shaped how the marketplace itself was structured and evolved over time. This evolution was not unique to the United States, either, as Beauchamp shows that similar commercial and legal battles played out in England between Bell, Edison, and their respective commercial firms, albeit in a different political and institutional context across the pond.⁴¹

Through careful recounting of the many commercial dealings between the myriad actors in an innovation economy—between inventors and investors, between patentees and their corporate partners, between the corporate board members of patent-owning firms engaging in licensing or manufacturing, and ultimately between different patent-owning corporations themselves—*Invented by Law* provides an engrossing case study of “the close connection between intellectual property and organizational development.”⁴² What makes this case study such a fascinating tale to tell, and one that is highly robust in terms of the lessons it teaches, goes far beyond the cultural milieu of Bell and the telephone or even the prominent legal disputes that arose from it. The reason is that, as Beauchamp so deftly

33. *Id.* at 24.

34. *Id.* at 25.

35. *Id.* at 25-26.

36. *Id.* at 38-39.

37. BEAUCHAMP, *supra* note 5, at 41-47.

38. *Id.* at 55.

39. *See generally id.*

40. *See generally id.*

41. For instance, the British government’s monopoly on telegraphic communications, placed in its Post Office, uniquely affected both the legal and commercial developments of the telegraph in England, as Beauchamp so expertly details in Chapter 5 of *Invented by Law*. *Id.* at 109-29.

42. BEAUCHAMP, *supra* note 5, at 163.

shows, “broad patent rights took their place at the center of the telephone’s business history.”⁴³

There are far too many well-detailed examples of this point in *Invented by Law* to cover in this review essay and to try to do so would fail to replicate Beauchamp’s utterly engaging prose in presenting this same information. Also, just to be clear, the numerous patent infringement lawsuits were equally important, because the construction of the patents by attorneys and judges defined how these companies could leverage their intellectual property against competitors in the marketplace. For instance, Beauchamp makes it very clear that the broad construction given to Claim Five of Bell’s first patent by various federal judges and then by the Supreme Court in Chief Justice Waite’s opinion, which handed ultimate victory to Bell, was key to the Bell Telephone Company’s success in gaining commercial dominance over the nascent telephone industry.⁴⁴ Nonetheless, Beauchamp also presents a gripping account of the differences between business models in comparing the railroad industry and the telephone industry in their respective uses of patent licensing, patent pools, and other private-ordering arrangements.

This comparison is relevant to today’s policy debates, in keeping with the theme of this essay, because some academic commentators argue that the history of the railroad industry teaches important lessons for solutions to the smartphone war or to other problems allegedly caused by patents in today’s innovation economy.⁴⁵ In the late nineteenth century, the railroads successfully fought off patent infringement lawsuits brought against them by patent agents and patent-holding companies through defensive associations; in effect, they pooled their finances and other resources to take a united stand in legally defending themselves against what were then called “patent sharks.”⁴⁶ Today, commentators argue that similar defensive associations should be created to defend against patent lawsuits, especially in the high-tech industry in which multiple patent rights cover both hardware and software used in single devices sold to consumers, such as a smartphone.⁴⁷ Separately from these academic proposals, some high-tech companies have been aggregating patents into defensive patent pools or have been creating cross-licensing arrangements that prohibit enforcement of patents.⁴⁸

But there is a key difference between the late-nineteenth century railroads and today’s high-tech industry: Railroads did not rely on patents as the commercial fulcrum of

43. *Id.* at 171.

44. *Id.* at 58-85.

45. See, e.g., Colleen V. Chien, *Reforming Software Patents*, 50 HOUS. L. REV. 325, 389-90 (2012).

46. See *id.* at 390 (noting that “the effective organization of railroad groups was key to curbing the power of railroad patent sharks”); Earl W. Hayter, *The Patent System and Agrarian Discontent, 1875-1888*, 34 MISS. VALLEY HIST. REV. 59 (1947) (discussing patent “sharks” in the context of the patent wars involving farmers, who, similar to the railroads, formed defensive associations to fight them off).

47. See Chien, *supra* note 45, at 390 (noting that “these and other lessons from the past can help guide, redirect, and reassure current and future patent reform efforts”).

48. See, e.g., Raymond Millien, *Defensive Patent Pools: There are Surprisingly Few Options*, IPWATCHDOG (Dec. 10, 2012), <http://www.ipwatchdog.com/2012/12/10/defensive-patent-pools-there-are-surprisingly-few-options-2/id=31233> (describing defensive patent aggregator RPX and other defensive patent aggregators and pools); Brad Sheafe, *Google’s Patent Starter Program: What it Really Means for Startups*, CPIP (Sep. 8, 2015), <http://cpip.gmu.edu/2015/09/08/googles-patent-starter-program-what-it-really-means-for-startups> (describing in part the LOT Network, which is a defensive cross-licensing patent pool).

their business models. Railroads did depend on patented innovation—patents secured the technological innovations that made it a viable transportation service.⁴⁹ But the railroad companies used these property rights to internalize in single corporate entities the supply and distribution chains that constituted their business. Thus, as Beauchamp points out, the railroad companies built the tracks, owned the railway engines and cars, and directly sold rail service to customers.⁵⁰ The railroads profited through a business model in which they directly owned all of the capital, both intangible and tangible, that they used to sell a service in the marketplace.

The telephone industry was structured very differently from the get-go. Beauchamp explains that after he received his patent, Bell initially tried to sell it to Western Union but failed.⁵¹ If he had been successful, it might have resulted in a similar corporate structure for the telephone industry as the railroad industry, as Western Union would have owned everything necessary to build, maintain, and sell telephone services. Instead, after this failure, Bell and his business partners formed the Bell Telephone Company, and they chose to *license* the company's patents, creating a franchise business model to build and provide telephone service.⁵²

The result of Bell's and his investors' commercial decision meant that the telephone industry from the very beginning was disaggregated between different corporate entities in its supply and distribution chains. This is significant, because the only thing that kept them linked together in the marketplace were the patent licenses that controlled their respective use and sale of the patented technology. As Beauchamp points out, "patent rights became the fundamental shaping influence on the competitive structure of telephone service."⁵³ One byproduct of this fundamental decision as to their business model meant that patent lawsuits became one of the ways in which telephone companies like Bell Telephone and Western Union competed with each other, as each jockeyed for control of the patented technology that was the basis for their respective licensing business models.

The upshot of this account of the early telephone industry's licensing business model is that today's high-tech industry more closely resembles this business model than the single-firm business model of the railroad industry. The high-tech industry today lacks vertical integration in a single corporate entity that produces, distributes, and sells smartphones and laptops used by consumers. Instead, different companies produce hardware, such as memory chips (e.g., Micron and Samsung), Wi-Fi chips (e.g., Qualcomm), processors (e.g., Intel and AMD), etc. Different companies create the software used in high-tech devices (e.g., Microsoft, Apple, IBM, Google, Adobe, Mozilla, etc.). Different downstream companies then combine the hardware and the software into a single product that is sold

49. See Adam Mossoff, *A Simple Rule for Complex Innovation*, 44 TULSA L. REV. 707, 729-30 (2009) (discussing how the railroad displaced the canal system only after patented innovation, such as Westinghouse's air-brake, made it a feasible technology).

50. BEAUCHAMP, *supra* note 5, at 51.

51. *Id.* at 49.

52. *Id.* at 49-51. Notably, Samuel Morse and his business partners also created a franchise business model after Morse's failure to sell his patented electro-magnetic telegraph to the U.S. government. See Adam Mossoff, *O'Reilly v. Morse* (Geo. Mason L. & Econ. Research, Paper No. 14-22, Aug. 18, 2014), <http://ssrn.com/abstract=2448363>.

53. BEAUCHAMP, *supra* note 5, at 51.

to consumers, such as Dell, Hewlett-Packard, Samsung, HTC, etc. Even Apple, the company with arguably the most proprietary business model in the high-tech industry, licenses third parties to manufacture its famous computers and mobile devices; the elegant box in which an Apple device is sold to a consumer says, “designed in Cupertino,” not “manufactured in Cupertino.”⁵⁴ What unites all of these distinct corporate entities in the vast, worldwide supply and distribution chains that comprise the high-tech industry are patent licenses and related contracts predicated on property rights. This market structure is similar to the nascent telephone industry of the late nineteenth century, not the railroad industry.

Beauchamp’s in-depth historical analysis of the rise of the telephone industry in the late nineteenth century confirms that appeals today to railroad industry’s defensive patent litigation associations in the late nineteenth century are inapposite as sources of inspiration to any alleged patent litigation problems in the high-tech industry today. Although the telephone industry over the following decades ultimately gravitated toward consolidation through mergers and acquisitions, its initial structure more closely paralleled today’s high-tech industry in which the licensing of patents was the “organizing asset” of the first two primary companies, Bell Telephone and Western Union.⁵⁵ Western Union made up for its failure to purchase Bell’s patents by purchasing patents on telephone technology from the famous inventor, Thomas Edison, as well as from other inventors.⁵⁶ Bell also acquired patents from other inventors to buttress his position against Western Union and Edison.⁵⁷

Beauchamp explains that the initial competition and threats of litigation in the U.S. between Bell Telephone and Western Union ultimately concluded in the same way that many conflicts conclude in patent-intensive industries in which multiple patents owned by separate entities cover a single product sold in the marketplace: a patent pool.⁵⁸ Given the structure of the high-tech industry in which different companies own different patents covering various aspects of a computing device, patent pools are used heavily.⁵⁹ Unsurprisingly, Bell Telephone and Western Union ended their legal dispute with “a pooling of the fundamental patents,” as each company held “a portfolio of patents on different aspects of voice-communication technology.”⁶⁰ Through continued purchases and licenses, however,

54. See Benjamin Kabin, *Apple’s iPhone: Designed in California But Manufactured Fast All Around the World*, ENTREPRENEUR (Sep. 11, 2013), <http://www.entrepreneur.com/article/228315>; Kenneth Rapoza, *How Much of the iPhone is ‘Made in China’?*, FORBES, Jan. 31, 2012, <http://www.forbes.com/sites/kenrapoza/2012/01/31/how-much-of-the-iphone-is-made-in-china>.

55. BEAUCHAMP, *supra* note 5, at 52.

56. *Id.* at 51-52.

57. *Id.* at 54-55.

58. *Id.* at 27, 53. See, e.g., Adam Mossoff, *The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s*, 53 ARIZ. L. REV. 165, 205 (2011).

59. See, e.g., Terry Hart, *Common Ground Between Creativity and Innovation*, COPYRIGHT ALLIANCE (Oct. 16, 2014), http://www.copyrightalliance.org/2014/11/common_ground_between_creativity_and_innovation#.ViEgVKRdEbw (“MPEG-LA pioneered modern patent pool practices in the 1990s. The organization privately developed a pool of all the essential technologies needed for the MPEG-2 format, used by DVD players and other digital video systems, and then offered a standardized license to manufacturers.”); Bill Geary & Chevy Chase, *Patent Pools in High-Tech Industries*, IAM MAGAZINE (Sept/Oct. 2009), <http://www.iam-media.com/Magazine/Issue/37/Management-report/Patent-pools-in-high-tech-industries> (discussing MPEGLA and other patent pools).

60. BEAUCHAMP, *supra* note 5, at 53.

Bell Telephone ultimately gained ascendancy and Western Union withdrew from telephone service.

This is not to say that there is no place for private-ordering mechanisms like defensive patent pools in the high-tech industry. The successes of some defensive aggregators and defensive patent pools in the high-tech industry prove that there is a legitimate place for such pools.⁶¹ But these few successes reveal that purely defensive private-ordering solutions in the high-tech industry have limited applicability. The reason is that patent licenses comprise the fundamental commercial mechanisms for non-vertically-integrated firms in patent-intensive industries to contract with each other at all points along widely disbursed supply and distribution chains. In this commercial context, the high-tech industry cannot organize around business models that do not rely on patents in this way, such as the railroad industry of yesteryear. Beauchamp does not compare the telephone and railroad industries for this purpose, nor does he explicitly compare the telephone to today's high-tech industry, but his historical analysis is directly applicable to both the academic and real-world policy debates about business models and patent pools today.

In this regard, there is one flaw, albeit minor, in Beauchamp's wide-ranging historical analysis of the differing business models predicated on property rights in innovation (patents). At times, he makes it seem like the reliance on patents as commercial assets is entirely an arbitrary choice innovators make when structuring their business models. Beauchamp says, for instance, that "[i]t is easy to imagine an alternative situation" for the telephone industry's commercial structure.⁶² Bell and his investors could have chosen to centralize all aspects of the supply and distribution chain for telephone service into a single corporate entity that did not rely on patents as the organizing feature of their business model. Instead, they made a different decision and chose a more disbursed model of commercial organization between distinct corporate entities that as a result had to enter into patent licenses and contractual agreements to create these same supply and distribution networks.

While Beauchamp is correct in the context of the railroad or telephone industries, it is not true that all industries are free from the demands of economic costs and benefits such that they are entirely free to choose how they structure their commercial organization and whether they rely on patents as the means to secure property rights in their products and services. Startups, for instance, require patents to create leverage against established industry giants or simply to prevent others from copying their innovative products and services; anecdotally, anyone who has watched *Shark Tank* can attest to this fact.⁶³ Ac-

61. See, e.g., Steven J. Vaughan-Nichols, *A Decade of Linux Patent Non-Aggression: The Open Invention Network*, ZDNET (Oct. 8, 2015), <http://www.zdnet.com/article/a-decade-of-linux-patent-non-aggression-the-open-invention-network>.

62. BEAUCHAMP, *supra* note 5, at 51.

63. See Mary Juetten, *Do Venture Capitalists Care About Intellectual Property?*, FORBES (Aug. 11, 2015), <http://www.forbes.com/sites/maryjuetten/2015/08/11/do-venture-capitalists-care-about-intellectual-property> ("[Venture Capital] firms put their money where there's IP. Look no further than *Shark Tank*. Have you ever watched an episode where the Sharks fail to grill the entrepreneurs on whether they have the appropriate IP protection?").

cordingly, venture capitalists consistently report that they rely on patents in making investment decisions in startups although there is some variance among industries.⁶⁴ These surveys and anecdotal reports are corroborated by a more formal, rigorous empirical study that finds a causal effect between a startup owning a patent and its ability to obtain financing from venture capitalists.⁶⁵ Moreover, industries that require substantial ex ante research and development costs with follow-on minimal marginal costs of production, such as the bio-pharma industry⁶⁶ and software companies in the high-tech industry,⁶⁷ also require the protections provided by intellectual property rights in order to recoup investments in R&D and to secure their freedom to commercialize the results of R&D in the marketplace.⁶⁸

But this is a small quibble compared to the impressive array of information, presented in a readable and engaging style, on how patents were utilized as commercial assets in licensing and in organizational development in the birth and early evolution of the telephone industry. In fact, one learns from Beauchamp that the famous playwright George

64. See *Examining Recent Supreme Court Cases Before the Supreme Court: Hearing Before House Subcommittee on the Courts, Intellectual Property, and the Internet of the H. Comm. On the Judiciary*, 114th Cong. 52 (2015) (statement of Robert P. Taylor on Behalf of Nat'l Venture Capitalist Ass'n), http://judiciary.house.gov/_cache/files/82249b9b-0dcc-460f-a873-95701adb6d82/114-2-93281.pdf. Taylor argued that

[f]or thousands of companies . . . patents are the *only* way to ensure a return on investment sufficient to justify the risks involved This group includes companies developing digital technologies that employ innovative hardware and/or software, energy technologies, communication technologies, new polymers and metallurgical materials, information technologies, medical devices, biologics and pharmaceuticals.

Stuart J.H. Graham, et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L. J. 1255, 1280 (2009) ("Firms that seek venture-funding appear to be patenting more actively prior to the funding event (and for the purpose of securing funding), and venture-capital investors appear much less willing to fund companies that hold no patents.").

65. See Joan Farre-Mensa, Deepak Hegde & Alexander Ljungqvist, *The Bright Side of Patents* (USPTO Econ. Working Paper No. 2015-5 Dec. 15, 2015), <http://ssrn.com/abstract=2704028> (finding a causal effect between a startup having a patent and its obtaining venture capital financing and succeeding in the marketplace).

66. See BARRY WERTH, *THE BILLION-DOLLAR MOLECULE: THE QUEST FOR THE PERFECT DRUG* 111-37 (1994) (discussing the early history of the modern pharmaceutical industry). Werth further writes:

The birth of drug research in the 1930s had introduced a bristling new competitiveness as companies sought to protect their investments. Where patents were once reviled, they were now pursued ruthlessly. Squibb, which had one patent in 1920, had more than 200 by 1940. In 1937 alone, Merck had filed forty-six domestic and foreign patent applications.

Id. at 122.

67. See Taylor, *supra* note 64, at 2.

68. See, e.g., Saurabh Vishnubhakat, *The Commercial Value of Software Patents in the High Tech Industry*, CTR. FOR THE PROT. OF INTELL. PROP. (May 2015), <http://cpip.gmu.edu/wp-content/uploads/2014/04/The-Commercial-Value-of-Software-Patents.pdf> (discussing commercialization function of patents in the software industry); John Edward Schneider, *Microorganisms and the Patent Office: To Deposit or Not to Deposit, That is the Question*, 52 FORDHAM L. REV. 592, 592, 594 (1984) (noting that "[t]he revolution in biotechnology is one of the most important developments affecting industry in the twentieth century" and that the Supreme Court's securing of patent protection in 1980 in *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) "spurred the increased commercial interest in biotechnology"). See also RONALD A. CASS & KEITH N. HYLTON, *LAW OF CREATION: PROPERTY RIGHTS IN THE WORLD OF IDEAS* 36 (2013) ("The capitalists who finance these innovations will not do so without the promise of a reward. Intellectual property forms a necessary ingredient in this supply network: without the promise of reward, capital will not support innovation; without capital, innovation will often be fitful and inadequate.").

Bernard Shaw worked briefly as a patent agent for the Edison Telephone Company in England.⁶⁹ Others have noted that the equally famous American author Mark Twain also offered his services to Nicola Tesla to be his patent agent in Europe.⁷⁰ The licensing business model and related commercial activities involving patents were so common and well-known at that time that everyone wanted to get into the business! *Invented by Law* is an excellent contribution to the growing literature on the long history of patents as commercial assets, exploring, in the case of Bell's telephone patent, how patented innovation was creatively deployed in the marketplace in a complex legal, political, and social context.

II. INNOVATION, LITIGATION CYCLES, AND PUBLIC CHOICE THEORY

Another aspect of *Invented by Law* that will be of much value to lawyers and legal scholars is Beauchamp's discussion of nineteenth-century patent litigation generally and specifically with regard to telephone patents. Again, this is of interest because many claim that there has been an "explosion" in patent litigation in recent years,⁷¹ and that this unique explosion in litigation is allegedly harming innovation in the high-tech industry and elsewhere.⁷² Many historians and economists, including Beauchamp himself in his other publications, have shown that this claim that there is massive patent litigation today unlike anything the U.S. has seen before is simply untrue.⁷³ In fact, so-called "patent wars" have been a common feature in America since at least the early nineteenth century.⁷⁴ Similar to the issue of patent licensing and other commercial uses of patents, *Invented by Law* presents evidence that today's smartphone war is anything but new.

In fact, by historical standards, the smartphone war is fairly small. The number of lawsuits in the smartphone war is around 200.⁷⁵ In the telephone patent war, Bell and his

69. BEAUCHAMP, *supra* note 5, at 116.

70. See Mossoff, *supra* note 25, at 970.

71. See, e.g., James Bessen & Michael J. Meurer, *The Patent Litigation Explosion*, 45 LOY. U. CHI. L.J. 401, 402 (2013).

72. See, e.g., Patrick Hall, *Patent Law Broken, Abused to Stifle Innovation*, WIRED (July 2013), <http://www.wired.com/insights/2013/07/patent-law-broken-abused-to-stifle-innovation>; Sheri Qualters, *Professors Issue Conflicting Views of Patent Reform*, NAT'L L.J. (Mar. 11, 2015), <http://www.nationallawjournal.com/id=1202720328088/Professors-Issue-Conflicting-Views-of-Patent-Reform?slreturn=20160006105307> (quoting Professor Michael Meurer) (stating that "there is clear harm to innovation caused by excessive patent litigation"). But see Letter from Forty Economists and Law Professors to House and Senate Judiciary Committees (Mar. 10, 2015), <http://cpip.gmu.edu/wp-content/uploads/2015/03/Economists-Law-Prof-Letter-re-Patent-Reform.pdf> (detailing extensive problems with Professor Meurer's and others' statistical claims today about the patent system); Adam Mossoff, *GAO Report Confirms No "Patent Troll" Litigation Problem*, CPIP (Oct. 4, 2013), <http://cpip.gmu.edu/2013/10/04/gao-report-confirms-no-patent-troll-litigation-problem> (reviewing criticism of Professor Meurer's and others' studies as being "nonrandom" and "nongeneralizable").

73. Khan, *supra* note 20, at 837-38; Beauchamp, *supra* note 13.

74. See, e.g., Mossoff, *supra* note 58 (discussing the patent war over the *sewing machine*); Mossoff, *supra* note 52 (discussing patent war over electro-magnetic telegraph); Adam Mossoff, *Top Ten Patent Wars* (unpublished manuscript) (on file with author); Beauchamp, *supra* note 13 (discussing patent wars in nineteenth century over well drilling technology and other inventions); Ron D. Katznelson & John Howells, *The Myth of the Early Aviation Patent Hold-Up – How a U.S. Government Monopsony Commandeered Pioneer Airplane Patents*, 24 INDUS. & CORP. CHANGE 1 (2015) (discussing the patent war over the airplane).

75. See Gupta et al., *supra* note 19, at 12 (identifying number of smartphone lawsuits in a timeline graph).

business associates filed approximately 600 lawsuits alleging infringements of Bell's patents on telephone technology.⁷⁶ Similarly, in setting the historical context for this litigation campaign by Bell, Beauchamp reports that the telephone patent war was not unusual either.⁷⁷ Among many other patent wars in the nineteenth century, two brothers who had an 1829 patent on a water-wheel filed more than 200 lawsuits in 1849 in a single state (Ohio).⁷⁸ Further, in 1850, just one of their assignees filed 150 lawsuits in Philadelphia.⁷⁹ The conventional wisdom today about the allegedly unprecedented spate of patent litigation that is the smartphone war falls prey to a rigorous and unbiased review of the historical record.

Moreover, the related claim that patent litigation is more complex, lengthy, and burdensome today than it was in yesteryear is also disabused in the pages of *Invented by Law*.⁸⁰ To take but one small example: Beauchamp reports how in just one of Bell's lawsuits, the defendant's attorneys deposed "dozens of witnesses" and ultimately collected "eight thousand pages of testimony evidence over three and a half years."⁸¹ The record of transcripts, motions, and related court documents before the Supreme Court in *The Telephone Cases* was twenty-two volumes and fifteen-thousand pages.⁸² Such massive documentation for patent trials was not unheard of, as thousands of pages of depositions and other records were collected in the 1850s during the sewing machine war.⁸³ It is important to guard against historical anachronisms, too, because this was a time before the modern technologies that have substantially reduced the transaction costs in producing legal documents and in interacting between lawyers, clients and judges, such as word processors, email, universal telephone service, faxes, automobiles, etc.

Just as today, these massive nineteenth-century litigation campaigns produced numerous legal, political, and social consequences. Today, there is a tremendous debate about the value and the role of patents in the innovation economy,⁸⁴ and after repeatedly trying in previous years, this year Congress seemed to be on the precipice of enacting another major legislative overhaul of the patent system in the name of "reforming" patent litigation practices.⁸⁵ Regulatory agencies like the Federal Trade Commission are investigating or taking actions in response to patent litigation and licensing practices.⁸⁶ Lastly,

76. BEAUCHAMP, *supra* note 5, at 12, 74.

77. *Id.* at 21-28.

78. *Id.* at 22.

79. *Id.*

80. See, e.g., Chien, *supra* note 45, at 334-35.

81. BEAUCHAMP, *supra* note 5, at 74.

82. *Id.* at 81.

83. See Mossoff, *supra* note 58, at 191 (reporting how in one lawsuit in the sewing machine war, a single deposition transcript was "three thousand five hundred and seventy-five pages").

84. See sources cited *supra* note 64.

85. See, e.g., J.C. Boggs et al., *Debate on Patent Reform Legislation Continues in Congress: What You Need to Know*, BLOOMBERG L. (Aug. 12, 2015), <http://www.bna.com/debate-patent-reform-n17179934625>; Dennis Crouch, *Patent Reform Slows Down in Congress*, PATENTLYO (July 15, 2015), <http://patentlyo.com/patent/2015/07/patent-reform-congress.html>.

86. See, e.g., Kristen Osenga, *Sticks and Stones: How the FTC's Name-Calling Misses the Complexity of Licensing-Based Business Models*, 22 GEO. MASON L. REV. 1001 (2015) (discussing the FTC's ongoing investigation of patent licensing companies); Edward Wyatt, *F.T.C. Settles First Case Targeting 'Patent Troll'*, N.Y. TIMES (Nov. 6, 2014), <http://www.nytimes.com/2014/11/07/business/ftc-settles-first-case-targeting-patent>.

the Supreme Court has been deciding patent cases in recent years at a rate not seen since the nineteenth century.⁸⁷ These legislative, regulatory, and judicial activities have taken place in part in response to the rise of the smartphone war and the perception that there is an unprecedented amount of patent litigation,⁸⁸ as well as in response to complaints that the Court of Appeals for the Federal Circuit, which has sole jurisdiction over all patent appeals, was too solicitous in crafting legal rules in favor of patent owners.⁸⁹

As Beauchamp wisely observes early in *Invented by Law*, all of these legal and policy battles have happened before, and the saga of the telephone patent war illustrates this point.⁹⁰ On both sides of the Atlantic, judges and justices proved amenable to attorneys' arguments for very broad constructions of some of the key patents asserted in lawsuits filed in the United States and in England. In the United States, it was the extremely broad reading of Claim Five of Bell's first patent—a claim Bell himself originally thought to be unimportant relative to the other claims in his patent—that gave the Bell Telephone Company legal and commercial control over all follow-on telephone technology for the life of Bell's patent.⁹¹ In England, it was an equally broad reading of a patent that led to charges in the newspapers of “patent warping” by the judges.⁹² In both instances, the courts did this under the longstanding legal rule in both countries that “pioneer patents”—patents covering technological advances that create an entirely new field of endeavor—should be broadly construed in favor of the patentees.⁹³ Of course, these cases were extremely complex, just as patent lawsuits are today, with numerous arguments by defendants about lack of novelty or prior disclosure by the inventors in an attempt to invalidate the patents, as well as extensive arguments by defendants about technical minutia in an attempt to escape liability even if the patents were deemed to be valid. The extensive details on these points are thoroughly presented with great flair throughout Beauchamp's *Invented by Law*.

The purpose here is not to recount these details, which is impossible to do in a brief review essay, but rather to point out an interesting byproduct of this judicial eagerness to broadly construe patents, even when there is a colorable argument that such an interpretation may be unwarranted. As defendants in the telephone patent war lost in court with their legal arguments, they refocused their efforts on the other branches of the government, the executive and the legislative branches, who are more receptive to lobbying by special interests. To wit, Beauchamp's historical tale presents not just another case study in patents as commercial assets framed by background litigation but also a case study in how public

troll.html.

87. One-half of the total patent cases decided by the Supreme Court since 1972 have been decided in the past nine years (28 cases decided since 2006). See *Supreme Court Patent Cases*, WRITTEN DESCRIPTION, <http://writ-tendescription.blogspot.com/p/patents-scotus.html> (last visited Oct. 2, 2015); Adam Mossoff, *The Trespass Fallacy in Patent Law*, 65 FLA. L. REV. 1687, 1688-89 n.4 (2013) (discussing comparison to nineteenth-century patent cases).

88. See *supra* notes 71-72.

89. See, e.g., William M. Landes et al., *An Empirical Analysis of the Patent Court*, 71 U. CHI. L. REV. 111, 128 (2004) (stating that the Federal Circuit has “pro-patent leanings”).

90. See generally BEAUCHAMP, *supra* note 5, at 65-68, 80-85.

91. *Id.*

92. *Id.* at 155. Notably, Edison and Bell had joined forces in a single company in England by this time, and it was Edison's follow-on technological contributions to the telephone that were now being used in the industry.

93. *Id.* at 62-63, 156-67.

choice theory worked in late-nineteenth-century patent law.

This is not surprising. In the nineteenth century, it was common for defendants of patent infringement lawsuits and their public supporters to play on populist rhetoric. In the 1840s, for instance, one prominent company sued by Samuel Morse for infringing his patented telegraph called itself “The People’s Line,”⁹⁴ and its president attacked Morse and his business partners as a “monopoly” that infringed everyone’s “Equal Rights to all modes of Telegraphing.”⁹⁵ This populist rhetoric continued in the telephone war: one prominent defendant named his company the “People’s Telephone Company,”⁹⁶ and newspapers supporting him attacked Bell’s company as an “odious monopoly.”⁹⁷ Thus, when they lost in court, it is unsurprising that they “moved to exploit their political assets” in taking their arguments (and money) to the federal officials who would be more receptive and responsive—Congress and the Executive.⁹⁸

As Beauchamp details in Chapter 4, defendants lobbied Congress to enact various patent “reforms,” but, even with pressure on Congress from the public uproar over other patent litigation campaigns and congresspersons proclaiming a willingness to enact legislation limiting or even abolishing patents, this proved futile.⁹⁹ So the defending telephone companies eventually turned to the Executive Branch. Focusing their energies on a relatively few number of relevant officials, such as Attorney General Augustus Garland, as opposed to hundreds of congresspersons, they achieved greater success, at least initially. Through classic cronyism, they convinced Attorney General Garland to initiate two separate legal actions by the U.S. government, against Bell alleging that Bell had committed fraud on the patent office. These arguments, though, consisted entirely of the same legal arguments raised by the defendant companies and which had already failed in court; for example, that Bell’s patent was invalid because it was not novel. Beauchamp thus details how the government’s legal campaigns against Bell were dogged by scandal and beset with the to-be-expected inefficiencies that accompany “a thoroughly *ad hoc* mobilization of government power.”¹⁰⁰ Beauchamp does not expressly frame these shifting legal and political strategies by accused infringers of Bell’s patent as an exemplar of public choice theory but for anyone schooled in this theory, the evidence is there. For instance, Beauchamp notes at one point that lawsuits by the government, like those brought against Bell, “were disproportionately sought during high-stakes, sometimes highly political, patent struggles.”¹⁰¹

We are again witnessing something similar today, at least in its broad outlines. In response to the perception that the Federal Circuit was too pro-patent, aggrieved defendants and their allies, especially in the high-tech industry, took their arguments elsewhere.¹⁰²

94. Mossoff, *supra* note 52, at 41.

95. *Id.*

96. *Id.* at 74.

97. BEAUCHAMP, *supra* note 5, at 80 (internal quotations omitted).

98. *Id.* at 89.

99. *Id.* at 86-108.

100. *Id.* at 87.

101. *Id.* at 92.

102. Kellan Howell, *Patent Law Reform Bill to Stop Trolls Could Also Stifle Innovation, Critics Say*, WASH. TIMES, Feb. 5, 2015, <http://www.washingtontimes.com/news/2015/feb/5/patent-law-reform-bill-to-stop-trolls->

They went to regulatory agencies in the Executive Branch, like the Federal Trade Commission, which has held fact-finding conferences on the role of patents in the innovation economy¹⁰³ and is now officially investigating patent licensing and whether this business model harms innovation.¹⁰⁴ They also went to Congress, which began a process of considering “patent reform” legislation in 2007 that eventually produced the America Invents Act of 2011 and which continues to this day.¹⁰⁵ They even went to the President. In 2015, the *Wall Street Journal* reported that Google, a prominent lobbyist for patent legislation,¹⁰⁶ has had in-person meetings with President Barak Obama “about 230 times, or an average of roughly once per week” since he took office in 2008.¹⁰⁷ In 2013, President Obama participated in a Google Hangout online chat in which he called for new legislation to stop patent-owners who allegedly “extort” money by filing lawsuits,¹⁰⁸ and President Obama’s Council of Economic Advisors released a report that same year attacking “patent trolls” for harming innovation.¹⁰⁹ These public policy arguments eventually awoke the sleeping giant in American law—the Supreme Court—which sprang into action in recent years and reversed many Federal Circuit’s decisions.¹¹⁰

In *Invented by Law*, Beauchamp details how pro-patent and anti-patent forces ebbed and flowed throughout the nineteenth century as new technological innovation led to patent wars, which led to spirited public policy debates about patents and then to government action in at least one if not all three branches of the government. This pattern occurred again in the twentieth century, and it certainly is occurring again in the first couple decades of the twenty-first century. In the Syfy Channel’s version of the television series, *Battlestar Galactica*, the Cylons repeatedly intoned, “All of this has happened before, and all of this will happen again.”¹¹¹ Beauchamp makes a similar invocation in his monograph, and the evidence he marshals for proving the historical premise in this proposition about cycles of

could-stifle (describing how in 2014, “Google spent about \$17 million on lobbying, and the majority of its efforts were focused on patent reform. . . . Google spent more money than any other tech company on copyright, patent and trademark lobbying last year, according to the Center for Responsive Politics, which tracks campaign and lobbying expenditures”); Gene Quinn, *The Hidden Agenda Behind Patent Reform*, IPWATCHDOG (Nov. 6, 2013), <http://www.ipwatchdog.com/2013/11/06/the-hidden-agenda-behind-patent-reform/id=46051> (describing extensive lobbying for legislative revisions to patent system since before the America Invents Act of 2011).

103. See *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* (Mar. 2011), at <https://www.ftc.gov/sites/default/files/documents/reports/evolving-ip-marketplace-aligning-patent-notice-and-remedies-competition-report-federal-trade/110307patentreport.pdf>; *Patent Assertion Entities Activities Workshop* (Dec. 10, 2012), <https://www.ftc.gov/news-events/events-calendar/2012/12/patent-assertion-entity-activities-workshop>.

104. See Osenga, *supra* note 86, at 1004-13 (describing the FTC’s 6(b) study of “patent assertion entities”).

105. See Mossoff, *supra* note 87, at 1689 (describing the congressional and regulatory activities in response to the “clarion call for reform of the patent system”).

106. *Id.*

107. See Brody Mullins, *Google Makes Most of Close Ties With White House*, WALL ST. J., Mar. 24, 215, at <http://www.wsj.com/articles/google-makes-most-of-close-ties-to-white-house-1427242076>.

108. See Kristen Osenga, *Formerly Manufacturing Entities: Piercing the “Patent Troll” Rhetoric*, 47 CONN. L. REV. 435, 435 n.2 (2014).

109. See Council of Econ. Advisers, Nat’l Econ. Council, & Off. of Sci. & Tech. Pol’y, *Patent Assertion and U.S. Innovation* 1 (June 2013), at https://www.whitehouse.gov/sites/default/files/docs/patent_report.pdf.

110. Cf. Timothy R. Holbrook, *The Return of the Supreme Court to Patent Law*, 1 AKRON INTELL. PROP. J. 1, 2 (2007) (noting as early as 2007 “a renewed interest in patent law by the Court and perhaps an increasing skepticism of the Federal Circuit’s ability to be the sole arbiter of patent law”).

111. See *Battlestar Galactica* (NBC Universal Television 2004-2007; Universal Media Studios 2007-2009).

innovation, patent litigation, and wide-ranging policy debate is overwhelmingly convincing.

III. CONCLUSION

Invented by Law is a *tour de force* of historical scholarship on patent law that will prove valuable to lawyers, law professors, historians, academics, judges, and policy-makers for many years to come. Unfortunately, this brief review essay could touch on only a few issues of possible interest to readers. To show the relevance of this important monograph to lawyers and others engaged in the patent policy debates today, this essay covered Beauchamp's in-depth analysis of how patents functioned as commercial assets in the nineteenth-century innovation economy and how the massive patent wars that followed this innovation reflect the same public choice concerns that one might have about today's patent policy debates waging in Washington, D.C. and elsewhere.